

REMARKS/ARGUMENTS

In the Office Action of July 15, 2009, claims 1-11, 16 and 17 are rejected. Additionally, claims 12-15 are objected to, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. In response, claims 1-3, 7-11, 14 and 16 have been amended. Additionally, claims 6, 12, 13 and 15 have been canceled and new claims 18-24 have been added. Applicant hereby requests reconsideration of the application in view of the claim amendments, the new claims and the below-provided remarks.

Allowable Subject Matter

Applicant appreciates the Examiner's review of and determination that claims 12-15 recite allowable subject matter. In particular, the Office Action states that claims 12-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In response, claim 1 has been amended to include the limitation of claim 6 and the limitations of claims 12, 13 and 15 in alternative language. As a result of the amendments to claim 1, claims 6, 12, 13 and 15 have been canceled and claims 7, 9, 10, and 11 have been amended to reflect the correct claim dependency. Because claims 12, 13 and 15 recite allowable subject matter, Applicant respectfully submits that amended claim 1 recites allowable subject matter and is therefore allowable.

Additionally, new claim 18 has been added to include the limitation of claim 1 and the limitation of claim 14. Because claim 14 recites allowable subject matter, Applicant respectfully submits that new claim 18 recites allowable subject matter and is therefore allowable.

Claim Rejections under 35 U.S.C. 102 and 35 U.S.C. 103

Claims 1, 4 and 6-11 are rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Carr (U.S. Pat. No. 3,099,836). Claims 1, 5, 16 and 17 are rejected under 35 U.S.C. 102(e) as allegedly being anticipated by Forster et al. (U.S. Pat. No. 7,375,699

B2, hereinafter “Forster”). Claim 2 is rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Carr in view of Hollman (U.S. Pat. No. 2,227,088). Claim 3 is rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Carr. However, Applicant respectfully submits that the pending claims are neither anticipated by nor obvious over the cited references for the reasons provided below.

Independent Claim 1

As described above, claim 1 has been amended to include the limitation of claim 6 and the limitations of claims 12, 13 and 15 in alternative language. Additionally, claim 1 has been further amended to correct informalities. Thus, Applicant respectfully submits that amended claim 1 recites allowable subject matter and is therefore allowable.

Dependent Claims 2-5, 7-11, 14, 16 and 17

Claims 2, 3, 7, 8, 14 and 16 have been amended to correct informalities. Support for the amendments to claims 2, 3, 7, 8, 14 and 16 is found in Applicant’s specification at, for example, original claims 1-17. Claims 2-5, 7-11, 14, 16 and 17 depend from and incorporate all of the limitations of independent claim 1. Thus, Applicant respectfully asserts that claims 2-5, 7-11, 14, 16 and 17 are allowable at least based on an allowable claim 1. Additionally, claim 3 is allowable for further reasons, as described below.

Claim 3 recites that “*the acute opening angle has a value of $30^{\circ} \pm 10\%$.*” Applicant respectfully asserts that claim 3 is not obvious over Carr because the range of the acute opening angle of claim 3 is critical and achieves unexpected results.

Applicants can rebut a *prima facie* case of obviousness based on overlapping ranges by showing the criticality of the claimed range. “The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.” *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). (See MPEP§2144.05).

Applicant’s specification, in particular Fig. 3-4 and the paragraph between page 14, line 16 and page 15, line 4, discloses that a maximum of the efficiency of the antenna

can be found at an opening angle of around 20⁰-30⁰. Therefore, Applicant respectfully asserts that the range of the acute opening angle of claim 3 is critical and achieves unexpected results. Thus, Applicant respectfully asserts that claim 3 is not obvious over Carr.

New Claims 18-24

New claims 18-24 have been added. As described above, claim 18 includes the limitation of claim 14. Thus, Applicant respectfully submits that claim 18 recites allowable subject matter and is therefore allowable. Additionally, new claims 19-22 have been added to include similar limitations to claims 2-5, respectively. Claims 19-22 depend from and incorporate all of the limitations of independent claim 18. Thus, Applicant respectfully asserts that claims 19-22 are allowable at least based on an allowable claim 18.

New claim 23 has been added to include similar limitations to claim 1 (as filed in September 1, 2006) and claim 3. Because of the similarities between claim 23 and claim 3, Applicant respectfully asserts that the above remarks with regard to claim 3 apply also to claim 23. Accordingly, Applicant respectfully asserts that claim 23 is not obvious over Carr. Additionally, new claim 24 has been added to include similar limitations to claim 4. Claim 24 depends from and incorporates all of the limitations of independent claim 23. Thus, Applicant respectfully asserts that claim 24 is allowable at least based on an allowable claim 23.

CONCLUSION

Applicant respectfully requests reconsideration of the claims in view of the claim amendments and the remarks made herein. A notice of allowance is earnestly solicited.

Respectfully submitted,

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